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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 24. August, 1922 No. 284.

COLOR TYPES OF CORALLORRHIZA MACULATA RAF.

H. H. Bartlett.

In the 7th edition of Gray's Manual, Ames describes *Corallorrhiza maculata* Raf. as madder-purple or yellowish; the white lip spotted with magenta-crimson. He notes the rare occurrence of pale forms without spots on the lip, petals, or sepals. In Britton and Brown's Flora the scape is described as purplish, the flowers as brownish purple, and the lip as white, spotted and lined with purple. There is also this note: "A form with yellow scape and flowers occurs in Nebraska (according to Williams)." Williams recorded his observations in an article entitled "Notes on the Canyon Flora of Northwest Nebraska" (Amer. Nat. **24**: 779–780. 1890) as follows:

"Leaving Harrison, we pitched our tent in War Bonnet Canyon . . . In nearly all of the canyons, especially the damper, darker ones, *Corallorrhiza multiflora* Nutt. grew quite plentifully, while only the darkest canyons afforded the rare *C. innata* R. Br. In a small canyon at the head of Jim Creek was found a lavender-yellow variety of the former species." The term lavender-yellow would seem to apply to a form with both purple and yellow pigmentation, rather than to a pure yellow, and unless the literature contains other observations by Williams which have eluded the writer's search, the occurrence of a pure yellow form in Nebraska is not clearly attested.

The pure yellow form of the East has been named *Corallorrhiza multiflora* var. *flavida* Peck. Originally described from New York, it has been reported by Alexander (Report Mich. Acad. Sci. **12**: 97.

1910), from the vicinity of Birmingham, Michigan. As will appear from the following quotation from a letter from Mr. Frederick J. Hermann, this variety is so distinct as to be worthy of recognition in our floras. He writes: "I am sending you a box containing three specimens of coral-root, and I wish you would please identify two of these for me. The first is a yellow one which I can't find described in any book on orchids. I had never seen it before yesterday, when I found about ten plants near Delaware, Keweenaw County, Mich., about twelve miles from Copper Harbor. Later in the day I found about six more specimens at Copper Harbor, Keweenaw County. Both of these colonies were in rather dense spruce woods, and growing in company with Menzies' rattlesnake plantain. At Delaware a few plants of *Corallorrhiza multiflora* were also growing with them. The second specimen is another one that I wish you would identify for me. The third is the common large coral-root (*C. multiflora*) which I thought you might like to use for comparison with the second."

Mr. Hermann's three types are all color varieties of *Corallorrhiza maculata* Raf. (=C. *multiflora* Nutt.), forming a series with regard to pigmentation similar to that in many cultivated plants, in which some varieties have yellow pigmentation due to glucosides of the flavonol group, other varieties, red or purple, containing anthocyanins. The Corallorrhiza series is exceptional in one respect, namely, that there is a variety with predominently brown coloration. This brown variety has a parallel in the brown-husked variety of maize, the latter being one of a series of color types in which the genetical relations have been carefully worked out by Emerson.[1] The brown type in maize has been found to contain a yellow flavonol glucoside, and the brown coloration is probably due to some unknown reaction of the yellow pigment with other plant constituents. If the maize series contains a type with a bright yellow coloration of the husk, it is as yet unknown. The parallelism of the color types in Corallorrhiza with those of plants which have been investigated genetically is pointed out, because it gives the best reason to assert confidently that these types are genetical entities, and not mere variations due to environment.

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[1] Emerson, R. A. The genetic relations of plant colors in maize. Cornell Univ. Agric. Exp. Sta. Mem. 39. pp. 156. 1921.

Advantage was taken of Mr. Hermann's fresh specimens to match their colors in Ridgway's "Color Standards and Color Nomenclature" (Washington, 1912). The first type, identified as var. *flavida,* has lemon-yellow flowers with an unspotted, white lip; scape and sheaths Martius-yellow. In the second type, which may be called var. *fusca,* the scape and developing fruits are light cinnamon-drab. (Perhaps this tint was what Williams called lavender-yellow, since it has both purple and yellow components.) The sheaths are Vandyke-brown, and give var. *fusca* its prevailing brown tone. In the third variety the scape and developing fruit are Perilla-purple. The sheaths are a much paler purple than the scape. In this type, which may be called var. *punicea,* there is no trace of brown whatever, in any part of the plant.

In species in which the genetical relations of yellow and purple types are known, the pure yellow has the most recessive factors and the deepest purple the most dominant factors. Geographic distribution indicates that the recessive types more often arise from the dominants than *vice versa.* Consequently the deeply purple-stemmed var. *punicea* might with some reason be viewed as the biological type of the species, and therefore chosen, in the absence of a type specimen, as the nomenclatorial type as well. In most species the var. *typica* is not formally named. These saprophytic orchids, however, undergo brown discoloration in drying, and are probably not varietally distinguishable from old herbarium material. Since practically all distribution records have been based upon dried material, there is a practical reason for wishing to continue to use the binomial for the species in the most comprehensive sense, without implying any particular variety. Consequently var. *punicea* is named as well as the other two. The species probably contains still other varieties.

By way of summary, the color types of *Corallorhiza maculata* may be characterized as follows:

Var. **flavida** (Peck) comb. nov. (*C. multiflora* [Nutt. var.] *flavida* Peck, N. Y. State Mus. Rep. **50**: 126. 1897.) scapis vaginisque et fructibus immaturis pallide flavis; floribus flavis; labello albo, immaculato.

Var. **fusca** var. nov. scapis et fructibus immaturis subfuscis, paulum rubrotinctis; vaginis atrofuscis; floribus ochraceis, purpureomaculatis; labello maculato.

Var. **punicea** var. nov. scapis et fructibus immaturis puniceis, vaginis pallide purpureis; floribus ochraceis, purpureomaculatis; iabello maculato.

Specimens of all three forms, collected by Frederick J. Hermann in the vicinity of Cooper Harbor, Keweenaw County, Michigan, 20 June 1922, are preserved in the Herbarium of the University of Michigan.

BOTANICAL GARDEN, UNIVERSITY OF MICHIGAN, Ann Arbor.

SOME INTERESTING PLANTS OF THE VIRGINIA COASTAL PLAIN.

E. J. GRIMES.[1]

(Plate 138.)

THE following plants have not hitherto been recognized as members of the coastal plain flora of Virginia, or are otherwise of interest. Practically all were collected on the peninsula between the York and James Rivers. Specimens of the species reported are deposited in the Grimes herbarium under the numbers given and there are duplicates in various other herbaria. Unless otherwise specified determinations were made by Mr. C. A. Weatherby at the Gray Herbarium. To all the botanists who have aided in this way, and to Mr. Edwin H. Lincoln for permission to use the copyrighted photograph reproduced herewith, grateful thanks are due.

Species new to Virginia are indicated by an asterisk; those new to the Gray's Manual range by two asterisks.

UNIOLA LONGIFOLIA Scribn. Near Williamsburg, Sept. 18, 1920. No. 3038. Dry white oak slope. Infrequent: the only station observed. Not hitherto reported north of Georgia on the Atlantic slope, though occurring in eastern Tennessee. Determined by Mrs. Agnes Chase.

PSILOCARYA CORYMBIFERA (C. Wright) Benth. Lake Drummond, near Portsmouth Ditch, Dismal Swamp, Oct. 2, 1921. No. 4534. Open swamp. A striking extension of range for this apparently rare and local species, not hitherto known north of Georgia.

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[1] These notes, reporting a number of remarkable extensions of range, were in process of compilation by Professor Grimes at the time of his death in December, 1921: they have been prepared for publication by Mrs. Grimes.—Ed.

*CAREX OXYLEPIS Torr. & Hook. Near Williamsburg. Mature perigynia collected May 9 and June 13, 1921. Nos. 3546 and 3717. Rather rich neutral soil of mixed hardwood upland. One station. Not reported north of South Carolina on the Atlantic slope.

*ERIOCAULON PARKERI Robinson. Chickahominy River near Lanexa, July 30, 1921. No. 4136. In shallow water at edge of river. Reported from Washington, D. C., in the second edition of Britton & Brown's Illustrated Flora, but not included in the recent Flora of the District of Columbia. In all probability new to Virginia.

*JUNCUS ASPER Engelm. (*J. caesariensis* Coville). Nos. 3992, 4616. First collected July 13, 1921; mature capsules collected Aug. 15 and Oct. 16. Found at a number of stations west of Williamsburg in sphagnum-magnolia swamps, in heavy, strongly acid soils. This local species has heretofore been supposed to be confined to southern New Jersey. The Virginia specimens seem to have fewer heads and slightly smaller inflorescence than those from New Jersey. Determined by Mr. F. V. Coville.

LUZULA SALTUENSIS Fernald. Near Williamsburg, April 9, 1921, No. 3400. Rich neutral soil of white oak and beech woods, associated with *L. campestris*, var. *bulbosa,* but preferring rather more fertile and moister soils. Less common than the latter, but frequent. Apparently not reported from eastern Virginia, though occurring comparatively near the coast in Georgia (*Harper*).

**DIOSCOREA QUATERNATA (Walt.) Gmel. Near Williamsburg May 9, 1921. No. 3527. Dry soil of hardwood slope. Not reported north of North Carolina.

**HABENARIA REPENS Nutt. Chickahominy River south of Lanexa, July 30, 1921. No. 4128. Wooded swamp along the river; one station only. Not reported north of Florida. Determined by Dr. H. M. Denslow.

*POGONIA AFFINIS Austin. Near Williamsburg, June 1, 1920, May 9, 1921. Nos. 2637, 3555. One station: see RHODORA xxiii. 195, Aug., 1921. Not reported south of Pennsylvania. The excellent photograph reproduced herewith was made by Mr. Edwin H. Lincoln from a living plant gathered at this station.

**PONTHIEVA RACEMOSA (Walt.) Mohr. James City County near Williamsburg, Sept. 19, 1920. No. 3078. Rich damp soil at base of an open slope. York County, near Williamsburg, Sept. 17, 1921.

No. 4386. Rich heavy calcareous soil of flood-plain thicket. Not reported north of North Carolina.

Hexalectris spicata (Walt.) Barnhart. Near Williamsburg. In full flower July 3, 1921. No. 3915. Rare. Observed twice during the summer of 1921 on rich calcareous soil of wooded slopes in slight shade. This species is reported from Virginia in the second edition of Small's Flora, but not in the second edition of Britton & Brown's Illustrated Flora published two months later. In order to remove any possible uncertainty, this definite record from the state is presented.

*Thlaspi arvense L. Williamsburg, May 4, 1920. No. 2534. Weed in alfalfa field. Apparently not previously reported from Virginia.

Parnassia asarifolia Vent. Near Elko along the Chesapeake & Ohio R. R., Aug. 6, 1921. No. 4206. Growing in an open marsh: one station. Reported in the manuals as occurring only in the region of the Alleghanies.

Decumaria barbara L. June 15 and Sept. 19, 1920. Nos. 2709 and 3072. Apparently definitely reported in Virginia only from the Dismal Swamp, but common as a liana throughout the peninsula.

*Lotus corniculatus L. York County, east of Williamsburg, June 13, 1920. No. 2697. Frequent in flat pine woods in sandy soil. Not reported from Virginia in current manuals.

*Euphorbia marilandica Greene. West of Williamsburg, Sept. 9, 1921. No. 4361. Dry soil of abandoned fields. This little-known and apparently local species has hitherto been reported only from eastern Maryland. Very probably it occurs at other stations in this region. It has been suggested that it may be a hybrid of *E. corollata* and *E. ipecacuanhae*, but, thus far, the latter has not been collected on the peninsula.

**Euphorbia prostrata Ait. Williamsburg, Oct. 16, 1921. No. 4640. Weed on stone steps of old house, also along pavements. A tropical and subtropical species, which has apparently not been reported north of Florida, though it has been collected at Charleston, S. C. (*B. L. Robinson*).

Stewartia pentagyna L'Hér. South of Williamsburg, June 24, 1921. No. 3818. Heretofore thought to be strictly confined to the mountains of the Alleghany area, this very beautiful shrub was found in full flower in June, 1921, on dry wooded slopes along a tributary of College Creek, south of Williamsburg. It is abundant on the south side of this stream for about a mile. This is the only station known and is in rough wooded country nearly a mile from the nearest house of any kind. It does not seem at all likely that the shrub was introduced by man since it has not been observed in any of the old gardens.

**HYPERICUM SETOSUM L. Williamsburg, Aug. 15, 1921. No. 4237. West of Williamsburg on sandy pine flats in open situations, infrequent. Not reported north of North Carolina.

**VIOLA VILLOSA Walt. Three miles northeast of Williamsburg, March 28, 1921. No. 3356. Growing in dry sandy soil in pine woods. Scarce. This is the most northerly station known for this species. There is one other record (unpublished) for the state, the plant having been collected by Dr. H. D. House at Gilmerton, Norfolk Co., April 19, 1913. Determined by Dr. Ezra Brainerd.

VIOLA PEDATA L. West of Williamsburg, April 17, 1921. No. 3437. One station only observed, in sandy clearing at edge of flat pine woods. This is not, of course, new to the flora of this region, but is interesting since the oldest collection of Linnaean material was from Virginia in 1688. *V. pedata,* var. *concolor* Th. Holm is very abundant. Determination by Dr. Brainerd.

LILAEOPSIS LINEATA (Michx.) Greene. North of Williamsburg, June 28, 1921. No. 3863. Growing in tidal marsh of Queen's Creek, which flows northeast into the York River. A widely distributed species, hitherto reported in Virginia only from Colonial Beach, Westmoreland Co. (*Coville*).

**AJUGA CHAMAEPITYS (L.) Schreb. Southern shore of York River north of Williamsburg, July 15, 1921. No. 4020. Aug. 20, 1921. No. 4273. A European species, heretofore unknown in North America. It is well established on the edge of a tidal marsh along the river, growing in loose sand containing fragments of calcareous shells, a quarter of a mile from the nearest and only house in the vicinity. There is no evidence of its introduction, except a heap of oyster shells near by, which indicates that fishermen used this spot as a landing to open their oysters in times past. When first found, July 15, 1921, it had apparently been in flower for several weeks, and it continued to flower as late as Oct. 8. Determined by Mr. Paul C. Standley.

*Sherardia arvensis L. Williamsburg, June 10, 1920. No. 2691. In grass in an orchard at edge of town. Not reported from Virginia in current manuals.

**Chrysopsis aspera Shuttl. Near Williamsburg, Sept. 19, 1920. No. 3044. Occurs in dry clay soil; frequent in open situations. Not reported north of North Carolina.

Rudbeckia laciniata L., var. humilis Gray. Near Williamsburg. 1920 and 1921. Nos. 4372, 4598, 4469, 3242, 4600. Wooded flood-plain swamps and wet thickets at a number of stations. Previously reported only from the region of the Alleghanies.

**Helianthus Schweinitzii T. & G. Near Williamsburg, Sept. 27, 1921. No. 4474. Sphagnum-magnolia swamp. Not reported north of North Carolina.

College of William and Mary, Williamsburg, Va.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT,—XXXVI.

ERICACEAE.

ANDROMEDA.

A. glaucophylla Link. Cold peat-bogs; occasional from Needham and Natick northward; also at Billings Pond, Sharon.

ARCTOSTAPHYLOS.

A. Uva-ursi (L.) Spreng., var **coactilis** Fernald & Macbride. See Rhodora xvi. 211–213, 1914. Dry sandy and rocky soil, frequent throughout.

CALLUNA.

C. vulgaris (L.) Hull. Moist pasture, Tewksbury (*J. Dawson*, 1860; *Wm. Boott*, Aug. 1861; *A. Gray*, Sept. 2, 1861; other recent collections); Halifax (*E. & C. E. Faxon*, Sept. 7, 1890); Andover. See Rhodora ii. 53–54, 1900.

CHAMAEDAPHNE.

C. calyculata (L.) Moench. Bogs and swamps, common throughout.

CHIMAPHILA.

C. maculata (L.) Pursh. Dry woods, occasional.

C. umbellata (L.) Nutt., var. **cisatlantica** Blake. See RHODORA xix. 240–242, 1917. Dry woods, common throughout.

CHIOGENES.

C. hispidula (L.) T. & G. Occasional in northern part of district; frequent in *Chamaecyparis* swamps southward.

CLETHRA.

C. alnifolia L. Swampy places, common throughout; most abundant in southeastern towns.

EPIGAEA.

E. repens L. Dry woods and fields; well distributed originally, but seldom abundant, especially in recent years.

GAULTHERIA.

G. procumbens L. Woods and fields, common throughout.

G. procumbens L., forma **suborbiculata** Fernald.[1] Woods, a large patch, Concord (*George Buttrick*, autumn of 1895). See RHODORA xxii. 155–156, 1920. Specimens in herb. N. E. Botanical Club and herb. W. Deane.

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[1] The circumstances attending the securing of *Gaultheria procumbens* L., forma *suborbiculata* Fernald, the only record thus far for the district covered by this paper, are interesting and pathetic. George Buttrick was a descendant of an old Concord family and, with two maiden sisters, lived in Concord on the hill overlooking the bridge where the fight took place on April 19, 1775. The troops were commanded by Maj. Buttrick, great grandfather of George. Mrs. Deane and I spent the month of July 1893, with the family and Mr. Buttrick was keenly interested in my botanical work. Later, in November, 1895, he fell sick. A swelling in the throat, which was incurable, was slowly sapping his vitality, but he moved about the place and retained, as far as possible, the vigor of former years.

On December 1, 1895, I received an earnest request from Mr. Buttrick to call upon him. I immediately went to Concord and proceeded to the house. My journal says that I found him comfortable and suffering no pain. He was lying on the couch and knew that he had but few days more to live. Reaching under the sofa he drew forth a brown paper bag filled with dried plants of Gaultheria which he had gathered, not long before, some two and a half miles from the house. The plants covered an area of about a quarter of an acre and he was much struck by the shape of the leaves. He said that the leaves were very round and the plants pulled up much harder than the ordinary form. He hoped I could visit the spot, for Minot Pratt, who was with him at the time, would show me the way. He was sorry he couldn't go too, but he shouldn't be here for he was going away. It was very pathetic and I honored the New England grit of the man. I took the plants with me and specimens are in my own herbarium and that of the New England Botanical Club. Mr. Buttrick died on December 18, following, and I shall always connect his name with this interesting form of our common Checkerberry.—WALTER DEANE.

GAYLUSSACIA.

G. baccata (Wang.) K. Koch. Dry fields and open woods, common throughout.

G. baccata (Wang.) K. Koch, forma **glaucocarpa** (Robinson) Mackenzie. Borders of woods, Andover (*A. S. Pease*, July 27, 1903); Sherborn (*M. L. Loomis*, July 25, 1911); Norfolk (*R. A. Ware*, Aug. 8, 1911); Blue Hill, Norfolk Co. (*N. T. Kidder*, Aug. 11, 1919).

G. dumosa (Andr.) T. & G., var. **Bigeloviana** Fernald. See RHODORA xiii. 99, 1911. Peat-bogs, occasional west and north of Boston; only stations south being at Billings Pond, Sharon, and at Canton.

G. frondosa (L.) T. & G. Thickets and open woods; generally distributed, but not usually very abundant.

KALMIA.

K. angustifolia L. Pastures, roadsides and open woods, common throughout. Collected at Cambridgeport by George B. Emerson, June 30, 1838.

K. angustifolia L., forma **candida** Fernald. See RHODORA xv. 151–152, 1913. Sherborn (*M. L. Loomis*, June 15, 1913). Specimen in herb. Boston Soc. Nat. Hist.

K. latifolia L. Moist woods and swamps, frequent. Not abundant, but usually preserved by its isolation.

K. polifolia Wang. Peat-bogs, 11 stations in Essex and Middlesex Counties.

LEDUM.

L. groenlandicum Oeder. Dry pine woods near Arsenal, Watertown (*Wm. Oakes*, no date); Bedford (*L. L. Dame*, no date); Concord (*E. S. Hoar*, June 7, 1858; *Horace Mann*, 1862; *J. R. Churchill*, May 20, 1880; *Mrs. Alice Hickes*, June 5, 1888, and others); Littleton (*W. H. Manning*, Aug. 13, 1882); Natick, according to Dame & Collins, Fl. Middlesex Co., 63, 1888.

LEUCOTHOË.

L. racemosa (L.) Gray. Swamps and wet thickets; rare in northern portion; well distributed and fairly abundant from Middlesex Fells south and southwest. This shrub and *Clethra* are the favorite hosts for *Cuscuta compacta* Juss.

LYONIA.

L. ligustrina (L.) DC. Moist soil, common throughout. Forms with leafy inflorescence do not seem to be the southern var. *foliosiflora* (Michx.) Fernald.

MONESES.

M. uniflora (L.) Gray. Rich moist woods in Essex County (see J. Robinson, Fl. Essex Co. 74, 1880); also Reading, Stoneham, Westford, Waltham and Natick.

MONOTROPA.

M. Hypopitys L. Rich woods, occasional.

M. uniflora L. Damp woods, common.

PYROLA.

P. americana Sweet. Woods and open places, common.

P. chlorantha Sw., var. **convoluta** (Barton) Fernald. See RHODORA xxii. 49, 1920. Freely distributed over the district in dry open woods as far south as Walpole, and probably throughout.

P. elliptica Nutt. Woods, sometimes in the open; frequent, but not reported from southeastern towns.

P. rotundifolia L., var. **americana** (Sweet) Fernald. See RHODORA xxii. 122, 1920. Woods and open places, common.

P. secunda L. Rich woods; occasional from Norwood and Hopkinton north and east.

RHODODENDRON.

R. canadense (L.) BSP. Swamps, frequent in Essex and Middlesex Counties, rare southward.

R. canescens (Michx.) G. Don. Wooded banks of Jennings Pond, Natick (*K. M. Wiegand*, May 27, 1912); dry open woods, Wellesley Hills (*Isaac Sprague, Jr.*, May 25, 1911); specimen in herb. Boston Soc. Nat. Hist. Reports of *R. nudiflorum* from the western towns in Dame & Collins, Fl. Middlesex Co. 63, 1888 are probably this species.

R. maximum L. Wooded swamps at Medfield and Walpole.

R. nudiflorum (L.) Torr. Purgatory Swamp. It has been collected between 1880 and 1897.

R. VASEYI Gray. Persistent at old nursery site in Halifax and escaping into moist sandy woods (*J. A. Cushman, C. H. Knowlton* et al., May 30, 1907). A species from North Carolina.

R. viscosum (L.) Torr. Swamps and wet woods, common throughout.

R. viscosum (L.) Torr., var. **glaucum** (Michx.) Gray. Frequent with the typical plants.

R. viscosum (L.) Torr., var. **nitidum** (Michx.) Gray. Low woods, Blue Hill Reservation (*J. R. Churchill*, June 28, 1914); Marshfield (*J. R. Churchill & C. H. Knowlton*, July 4, 1914).

VACCINIUM.

V. atrococcum (Gray) Heller. Swampy ground, apparently common.

V. atrococcum (Gray) Heller, forma **leuco**co**ccum** Deane, n. comb. *V. corymbosum* var. *atrococcum*, forma *leucococcum* Deane, Rhodora iii. 265, 1901. Single bush with typical *V. corymbosum* and *V. atrococcum*, constant for years in a field near reservoir, Andover (*A. S. Pease*, July 27, 1901, May 11, 1902). Specimens in herb. N. E. Botanical Club and herb. Walter Deane. See Rhodora iii. 265. 1901.

V. corymbosum L. Wet woods to open hillsides, common throughout.

V. corymbosum L., var. **amoenum** (Ait.) Gray. Concord (*E. S. Hoar*, May 16, 1858); border of swamp, Sherborn (*M. L. Loomis*, May 14, 1912); Milton (*J. R. Churchill*, May 26, 1901); Blue Hill Reservation, Blue Hill River Road (*N. T. Kidder*, May 15, 1919); wet places near summit of Blue Hill (*N. T. Kidder*, Aug. 11, 1919).

V. corymbosum L., var. **pallidum** (Ait.) Gray. Swamp, Sudbury (*J. R. Churchill*, May 30, 1900); wet ground near swamp, Sherborn, (*M. L. Loomis*, May 18 and 22, July 22, 1912).

V. macrocarpon Ait. Bogs and swamps, common throughout, except possibly in western towns.

V. Oxycoccus L. Bogs, occasional from Canton north.

V. pennsylvanicum Lam. Dry fields and open woods, common throughout.

V. pennsylvanicum Lam., var. **myrtilloides** (Michx.) Fernald. See Rhodora xi. 54, 1909. Sherborn (*M. L. Loomis*, May 18, 1912); Tyngsboro (*F. S. Collins*, May 15, 1910).

V. pennsylvanicum Lam., var. **nigrum** Wood. Middlesex Falls, Winchester (*S. F. Blake*, July 21, 1912); specimen in herb. Boston Soc. Nat. Hist.

V. vacillans Kalm. Dry woods and light open soil, common.

V. Vitis-Idaea L., var. **minus** Lodd. "In pascuis siccis ad Danvers" (*Wm. Oakes*, about 1820). Specimens in herb. Gray and herb. N. E. Botanical Club. "The Danvers locality seems to stand alone toward the south" (Oakes). Also moist woods under pines, Putnamville, Danvers (*J. A. Sears*, June 18, 1897). See J. Robinson, Fl. Essex Co. 71, 1880.

C. H. Knowlton } *Committee on*
Walter Deane } *Local Flora*

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY, NEW SERIES, NO LXVII/

NOTES ON THE FLORA OF WESTERN NOVA SCOTIA 1921.

M. L. Fernald.

The results[1] of our exploration of Nova Scotia in 1920 were so gratifying that it seemed wise to continue the work, with Yarmouth as a center, during another season. Accordingly, Mr. Bayard Long and I devoted two months in 1921 to further investigation of the flora of western Nova Scotia. We were accompanied for all too short periods in July by Messrs. Edwin B. Bartram and Norman C. Fassett, and for a few days in September we had the active cooperation of Professor Horace G. Perry of Acadia University. The summer of 1920 had been abnormally wet, with the result that savannahs and lake-margins were often inaccessible or the characteristic plants of these habitats drowned or very tardy in development. In marked contrast, the summer of 1921 was phenomenally dry, in northwestern Nova Scotia to the point of extreme drouth; and the shores of undammed lakes were generally exposed, while small ponds had in some instances completely evaporated. We were consequently able to explore many places which were inaccessible in 1920, with the result that the ranges of a large proportion of the coastal plain types were extended and a good number of additions to our previous list of Nova Scotian plants discovered. Several regions, for example southwestern Lunenburg County, in the neighborhood of Bridgewater furnished days of thrilling botanizing and important discoveries, but they were all in general character so similar to our already described experiences of 1920, that they need not be related in detail. The itinerary of the summer, briefly stated, was as follows, the collecting being done by Mr. Long and myself unless otherwise stated.

July 13: Markland (Cape Forchu), Yarmouth Co., *Fernald, Bartram, Long & Fassett.*
July 14: Atwood Brook, Shelburne Co., *Bartram & Long.*
Upper Wood's Harbor, Shelburne Co., *Fernald & Fassett.*
July 16: Brazil Lake, Yarmouth Co., *Bartram & Long.*
Lake George, Yarmouth Co., *Fernald & Fassett.*
July 18: Annapolis Royal and Granville, Annapolis Co., *Fernald, Bartram, Long & Fassett.*

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[1] Rhodora, xxiii. 89-111 (1921), 130-152 (1921), 153-171 (1921), 184-195 (1921), 223-245 (1922), 257-278 (1922), 284-300 (1922).

July 19: Granville Center, Belle Isle, Lamb's Lake and Grand Lake, Annapolis Co., *Fernald, Bartram, Long & Fassett.*
July 21: Tusket and Gavelton, Yarmouth Co., *Fernald, Bartram, Long & Fassett.*
July 23: East Branch of the Tusket as far east as St. John (Wilson) Lake, Yarmouth Co., *Fernald, Bartram & Long.*
July 25: Windsor, Hants Co., *Fernald, Bartram & Long.*
July 26: Uniacke Lake and Five-Island Lake, Hants Co., *Fernald, Bartram & Long.*
July 27: Truro, Colchester Co. and Shubenacadie Grand Lake, Halifax Co., *Fernald, Bartram & Long.*
July 28: Darmouth and Armdale (Dutch Village), Halifax Co. *Fernald, Bartram & Long.*
August 2: Welshtown (Birchtown) Lake, Shelburne Co.
August 3: Roseway River, Shelburne Co., north to Jones Lake.
August 4: Shelburne to Sable River, Shelburne Co.
August 5: Harper Lake, Shelburne Co.
August 8: Weymouth, Digby Co.
August 9: Headwaters of Meteghan and Tusket Rivers, from Little Metehgan Lake to Wentworth Lake, Digby Co.
August 10: Drainage of Sissiboo River, from Everitt Lake to Mistake Lake, Digby Co.
August 12: West Branch of Tusket River, frcm Carleton to Parr Lake, Yarmouth Co.
August 13: Gavelton (Butler's) and Vaughan (Tusket) Lakes, Yarmouth Co.
August 15: Bridgewater, Lunenburg Co.
August 16: Bridgewater, Hebb's Lake, Fancy L., Wallace L., etc., Lunenburg Co.
August 17: Lahave River, north to Wentzell Lake; Mushamush River; Rhodes Corner; Blystner Lake; all in Lunenburg Co.
August 18: Wile's (Oakhill) Lake, Feindel's L., and Rhodeniser L., Lunenburg Co.
August 21: Yarmouth, Yarmouth Co.
August 22: Markland (Cape Forchu), Yarmouth Bar and Overton, Yarmouth Co.
August 23: East Branch of Tusket from Quinan to Canoe Lake, Yarmouth Co.
August 25: Salmon (Greenville) Lake to Arcadia, Yarmouth Co.
August 27: Shobel's Mt., Sandy Cove, Digby Co.
August 28: Sandy Cove to Freeport, Digby Co.
August 29: Lakes of Lequille and Liverpool Rivers, from Lamb Lake to Boot and Liverpool Head Lakes, Annapolis Co.
August 30: Annapolis Royal, Annapolis Co.
September 2: Sloane, Fanning, Skinner, Pearl and Crawley Lakes, Yarmouth Co., with *H. G. Perry.*
September 4: Parr Lake, Yarmouth Co., and Cedar Lake, New Tusket, Digby Co., with *H. G. Perry.*
September 5: Argyle Head to Belleville, Yarmouth Co., with *H. G. Perry.*
September 7: Clyde River, from Port Clyde to Upper Clyde River, Shelburne Co.
September 8: Harper, Western and Gold Lakes, Shelburne Co.
September 9: Jordan River, from Jordan Falls to Lake John, Shelburne Co.
September 10: Five-River (Morris) Lake and Bower's (Beaver Dam) Lake, Shelburne Co

The more important range-extensions and observations of the summer are enumerated below; as in the previous enumeration the species new to Canada (37) are marked **, the additional ones (25) new to Nova Scotia.*

WOODWARDIA VIRGINICA (L.) Moore. Besides occurring as already reported, in Yarmouth and Queens Cos., the Chain Fern is characteristic of boggy shores and thickets northeastward through Digby Co. to Annapolis Co. (near Lamb's Lake; near Liverpool Head L.) It is frequent throughout Shelburne Co., sometimes, as at Harper Lake, reaching a height of 1.7 m.

W. AREOLATA (L.) Moore. Rather frequent in the Tusket Valley, north to Pearl Lake, Kemptville and east to St. John (Wilson) Lake; splendidly developed in the sandy alluvium and lake-margins of the Roseway River system, Shelburne Co., plants from near the head of McKay's Lake, Middle Ohio, measuring 7 dm. high.

ATHYRIUM ACROSTICHOIDES (Sw.) Diels. Rich woods on north Mt., Belle Isle, Annapolis Co.

A. ANGUSTUM (Willd.) Presl, var. ELATIUS (Link) Butters. Swampy woods on slopes above Lahave River, Bridgewater, Lunenburg Co.

THELYPTERIS SIMULATA (Dav.) Nieuwl. Reported from Yarmouth to Queens; but now known eastward to LUNENBURG Co.: knolls in boggy thicket by Wile's (Oakhill) Lake. Extending north in Yarmouth nad Shelburne Cos. to Kemptville and to Jones Lake, Roseway River.

THELYPTERIS BOOTTII (Tuckerm.) Nieuwl. At various stations in Shelburne and Lunenburg Cos.

CYSTOPTERIS FRAGILIS (L.) Bernh., var. MACKAYI Lawson. Local on the basaltic North Mt.: collected near Granville, Annapolis Co., and on Shobel's Mt., Sandy Cove, Digby Co.

WOODSIA ILVENSIS (L.) R. Br. Basaltic cliffs and ledges, Shofel's Mt., Sandy Cove, Digby Co.

SCHIZAEA PUSILLA Pursh. Additional stations indicate, with those already recorded, that the Curly Grass is to be expected in proper habitats in all acid areas in the province. Unrecorded stations are, for DIGBY Co.: forming a close turf with *Vaccinium Oxycoccus* and *Rynchospora alba* at peaty border (many acres) of Tibert Lake, Freeport,—this, probably the most extensive station known for the species, within a few rods of the Bay of Fundy; wet sphagnous hollows in peaty savannah along The Brook, Central Grove. SHELBURNE Co.: depressions and knolls in sphagnous bog near Birchtown Brook; moist depressions in sandy *Corema*-heath and in wet sphagnous bog, Hope's Lot Barrens, Clyde River; wet mossy hollows in savannah east of Jordan Falls.

LYCOPODIUM INUNDATUM L., var. BIGELOVII Tuckerm. Reported as common in Yarmouth and Digby Cos. Abundant in Shelburne Co. and more locally in Lunenburg and Halifax Cos.

*Selaginella rupestris (L.) Spring. Basalt ledges, summit of Shobel's Mt., Sandy Cove, Digby Co.

*Isoetes macrospora Dur. Gravelly bottom of Clyde River, Middle Clyde.

I. echinospora Dur., var. Braunii (Dur.) Engelm. Gravelly and muddy bottoms of brooks, West Branch of Tusket River, Havelock and New Tusket, Digby Co.

Pinus Strobus L. The wind-swept and starved trees on the rocky barrens near Armdale, Halifax Co., have leaves only 2.5–5 cm. long and from a short distance away so strongly resemble *P. Banksiana* that such trees may have been the bases of unverified records of *P. Banksiana* from near Halifax.

Thuja occidentalis L. As suggested in Rhodora, xxiii. 188 (1921), Cedar Lake, east of Corberrie, Digby Co., proves to have a characteristic growth of *Thuja* at its border.

Potamogeton Oakesianus Robbins. Probably common throughout the silicious areas; additional collections from Lunenburg and Hants Cos.

P. pulcher Tuckerm. Digby Co.: quagmire-margin of Sears Lake, New Tusket (form with remarkably small and round emersed leaves). Lunenburg Co.: brook-beds in peaty swale by Rhodeniser Lake, east of Bridgewater.

P. amplifolius Tuckerm. Annapolis Co.: shallow water of Young's Lake, North Mt., Belle Isle. Digby Co.: peaty cove in Little Meteghan Lake.

P. confervoides Reichenb. Shelburne Co.: Swanburg Lake, Shelburne; Five-River (Morris) Lake.

In bog-pools near Argyle Head, Yarmouth Co., *P. confervoides* had developed, in early September, many winter-buds and tubers. The plants, which had fruited in July and early August, were nearly disintegrated, but their extensively creeping, filiform rootstocks bore short branches terminated by reddish fusiform tubers, while the old axils of the stems and the tips of the disintegrating branches bore fusiform dark-green winter-buds 0.7–2 cm. long, their leaves spreading-ascending.

P. dimorphus Raf. At several stations in Digby and Lunenburg Cos.

Scheuchzeria palustris L. Quagmires of Shelburne Co.

**Alisma plantago-aquatica L., var. parviflora (Pursh) Farwell, Ann. Rep. Comm. Parks & Boulev. Detroit, xi. 44 (1900). The small-flowered and -fruited southern extreme. Hants Co.: Windsor.

Panicum dichotomiflorum Michx. Shelburne Co.: dryish sandy beaches of Harper and Welshtown (Birchtown) Lakes.

P. VIRGATUM L., var. SPISSUM Linder, RHODORA, xxiv. 15 (1922). Besides the stations recorded in RHODORA, xxiii. 192 (1921), the following indicate a wide distribution in the province. YARMOUTH CO.: Goven and Gilfilling Lakes. SHELBURNE CO.: Bower's (Beaver Dam) Lake; McKay's and Jones Lakes, Roseway River. LUNENBURG CO.: Wentzell Lake.

P. DEPAUPERATUM Muhl., var. PSILOPHYLLUM Fernald, RHODORA, xxiii. 193 (1921) and forma CRYPTOSTACHYS Fernald, l. c. 194. Additional stations in Shelburne, Lunenburg and Halifax Cos.

P. SPRETUM Schultes. Additional stations are, for ANNAPOLIS CO.: Grand Lake and Liverpool Head Lake. DIGBY CO.: Journeay Lake, Weymouth. YARMOUTH CO.: Goven and Canoe Lakes. SHELBURNE CO.: Harper Lake. LUNENBURG CO.: Hebb's Lake, Bridgewater; mill-pond north of Blockhouse; Blystner and Rhodeniser Lakes.

**P. MERIDIONALE Ashe. YARMOUTH CO.: cobbly beach of Gavelton (Butler's) Lake, Gavelton; first station east of Massachusetts.

P. LINDHEIMERI Nash, var. SEPTENTRIONALE Fernald, RHODORA, xxiii. 227 (1922). LUNENBURG CO.: dry pine and oak woods on steep slopes along Lahave River, Bridgewater.

**P. CLANDESTINUM L. YARMOUTH CO.: rocky and gravelly thicket bordering Pearl Lake and dominant in thicket along Tusket (Kempt) River, Kemptville. LUNENBURG CO.: upper border of cobbly beach, Wentzell Lake. Heretofore unknown east of the Penobscot.

*ORYZOPSIS PUNGENS (Torr.) Hitchc. Characteristic of dry barrens of Shelburne and southwestern Lunenburg Cos.

CALAMAGROSTIS PICKERINGII Gray. Sandy and peaty barrens, eastward at least to Halifax Co.

C. PICKERINGII, var. DEBILIS (Kearney) Fernald & Wiegand. Similar habitats, more common.

SPHENOPHOLIS PALLENS (Spreng.) Scribn. Near Wentworth gypsum quarries, Windsor.

SPARTINA ALTERNIFLORA Loisel., var. PILOSA (Merr.) Fernald. Apparently frequent on salt marshes from Yarmouth Co. to Annapolis Co. and presumably beyond.

PHRAGMITES COMMUNIS Trin. ANNAPOLIS CO.: a large colony in the ditch and on the adjacent railroad bank bordering the salt marsh west of Annapolis Royal; most of the stolons subterranean, but some superficial and reaching a length of 7.6 m. (25 feet).

DISTICHLIS SPICATA (L.) Greene. Salt marshes, Yarmouth Co. to Annapolis Co.

*POA SALTUENSIS Fernald & Wiegand, var MICROLEPIS Fernald & Wiegand, RHODORA, xx. 124 (1918). ANNAPOLIS CO.: brookside in mossy woods near Yoong,s Lake, North Mt. Belle Isle.

GLYCERIA OBTUSA (Muhl.) Trin. Abundant eastward at least to Lunenburg Co.; extremely variable in stature, some colonies, in open bogs, fruiting when only 1.5–2 dm. high (panicles 4–6 cm. long), others, as at the quaking margins of Harpers and Western Lakes in Shelburne Co., making dense stands 1.2–1.3 m. high (panicles 1.7–1.9 dm. long).

GLYCERIA LAXA Scribn. Eastward to Hants and Halifax Cos.

**FESTUCA RUBRA L., var. MULTIFLORA (Hoffm.) Aschers. & Graebn. Roadsides, Dartmouth.

AGROPYRON CANINUM (L.) Beauv., forma GLAUCUM Pease & Moore. Crest of barrier beach, East Jordan, Shelburne Co.

*A. CANINUM (L.) Beauv., var. TENERUM (Vasey) Pease & Moore, forma CILIATUM (Scribn. & Sm.) Pease & Moore, RHODORA, xii. 72 (1910). Thin open humus and basaltic talus, North Mt., Belle Isle (Annapolis); Shobel's Mt., Sandy Cove (Digby).

ELYMUS VIRGINICUS L., var. HIRSUTIGLUMIS (Scribn.) Hitchc. DIGBY Co.: wooded basaltic talus, Shobel's Mt., Sandy Cove.

CYPERUS DENTATUS Torr. Eastward at least to Lunenburg Co.; characteristic of sandy or gravelly shores.

ELEOCHARIS ROBBINSII Oakes. Widely distributed; new stations in Annapolis, Hants and Lunenburg Cos.

E. OLIVACEA Torr. Additional stations are as follows. YARMOUTH Co.: peaty quagmire-pools in sphagnous bog near railroad station, Argyle Head. LUNENBURG Co.: peaty quagmire-margin of Wallace Lake, Italy Cross.

*E. NITIDA Fernald. Exsiccated roadside gutter, North Mt., Belle Isle, Annapolis Co.

The occurrence of this little plant on the basaltic North Mt. is interesting, since all its other stations (in Newfoundland, Quebec,and northern New Hampshire) are likewise on basic or more or less calcareous rock.

**E. TUBERCULOSA (Michx.) R. & S. Wet sandy or peaty beach of Harper Lake, Shelburne Co.; the typical southern plant, heretofore unknown from east of Massachusetts.

SCIRPUS OLNEYI Gray. An additional station in Yarmouth Co. is at the border of a salt marsh along Argyle River.

**S. CAMPESTRIS Britton, var. NOVAE-ANGLIAE (Britton) Fernald. Border of salt marsh, Jordan Falls, Shelburne Co.; heretofore unknown east of southern Maine.

RYNCHOSPORA FUSCA (L.) Ait. Common eastward at least to Lunenburg and Hants Cos.

R. CAPITELLATA (Michx.) Vahl. Common or at least frequent. New stations in Digby, Annapolis and Shelburne Cos.

R. CAPITELLATA, var. DISCUTIENS (Clarke) Blake. Additional stations are, for SHELBURNE Co.: wet peaty margin of Harper Lake; upper border of cobbly beach of Bower's (Beaver Dam) Lake.

Lunenburg Co.; upper border of gravelly beach, Feindel's L., west of Bridgewater.

Cladium mariscoides (Muhl.) Torr., forma congestum Fernald, Rhodora, xxiii. 234 (1922). Sphagnous boggy swale bordering Fancy Lake, near Conquerall, Lunenburg Co.

Carex straminea Willd. See Rhodora, xxiii. 235 (1922). Somewhat general, though often in only small quantity, on borders of savannahs along East Branch of Tusket R., Yarmouth Co.

C. Bebbii Olney. Hants Co.: dryish swales near Wentworth gypsum quarries, Windsor.

*C. adusta Boott. A single plant left growing among disturbed rocks by roadside. Armdale (Dutch Village), Halifax Co.; presumably more abundant somewhere in the neighborhood.

C. rosea Schkuhr. Damp thickets and clearings, North Mt., Granville, Annapolis Co.

***C. muricata* L. Abundant in large stools, open pastured slopes near Wentworth gypsum quarries, Windsor.

**C. lenticularis Michx., var. Blakei Dewey in Wood, Class Book, 755 (1861). Cobbly beach of Wentzell Lake, Lunenburg Co. Previously collected by *J. R. Churchill* at Ingonish, Cape Breton.

C. Swanii (Fernald) Mackenzie. *C. virescens*, var. *Swanii* Fernald. Occasional from Yarmouth Co. to Annapolis Co.

***C. panicea* L., var. *microcarpa* Sonder in Koch, Syn. ed. 2: 879 (1844). Thin open humus by roadside on North Mt., Belle Isle, Annapolis Co.

C. glauca Murr. Reported by Macoun in 1888 from "dry clay banks on the railway cutting just outside of Windsor." Now a very abundant and variable species throughout the gypsiferous region about Windsor.

*C. anceps Muhl. *C. laxiflora*, var. *patulifolia* (Dewey) Carey. Annapolis Co.: damp clearings and open rocky woods, North Mt., Granville; first authentic record from east of southern Maine, Macoun's earlier record being based on *C. leptonervia* Fernald.

C. cryptolepis Mackenzie. Somewhat local, Halifax and Lunenburg Cos.

C. scabrata Schwein. Digby Co.: rich thicket by brook, East Ferry.

C. oligosperma Michx. Apparently general in the acid areas.

***C. hirta* L. Abundantly naturalized on a sandy railroad bank, Annapolis Royal.

Although here recorded apparently for the first time from Canada, *C. hirta* was collected in 1912 in a pastured field at Charlottetown, Prince Edward Island, *Fernald & St. John*, no. 7106.

C. lupulina Muhl. Yarmouth Co.: swale by Ogden Lake. Lunenburg Co.: by brook flowing into Caribou Lake.

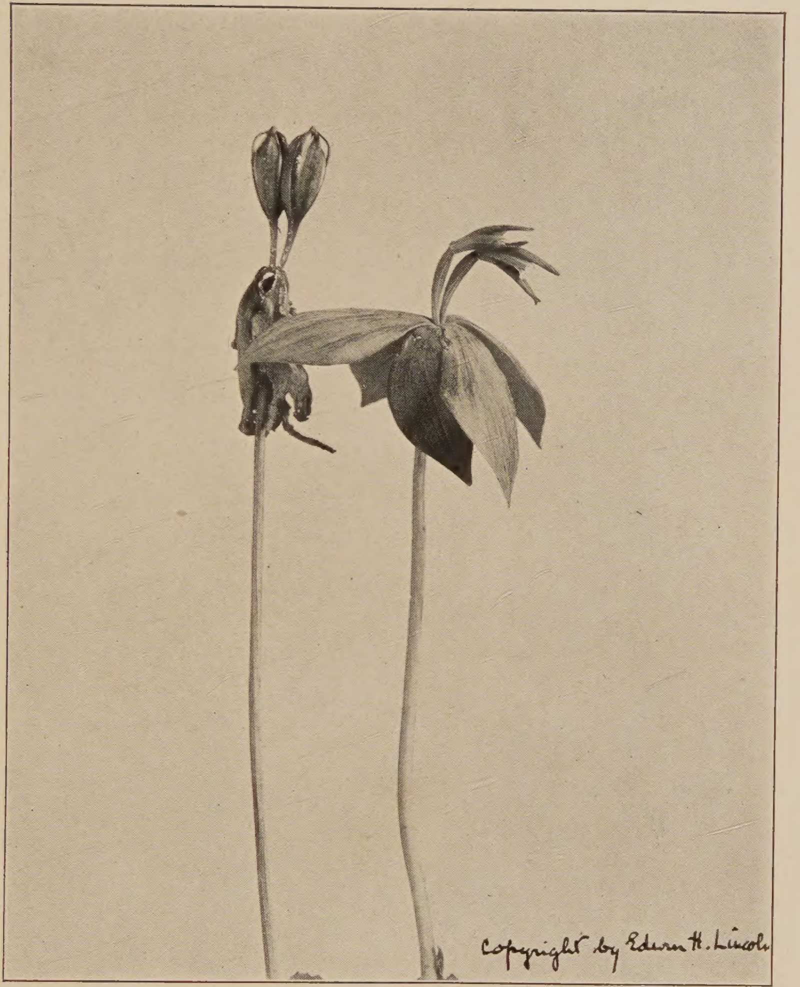
C. Michauxiana Boeckl. Shelburne Co.: boggy savannah along Tigney Brook, Sable River. Halifax Co.: sandy swale bordering Shubenacadie Grand Lake.

C. bullata Schkuhr, var. Greenei (Boeckl.) Fernald. Northeastward to Annapolis Co. and east to Lunenburg Co.

Xyris montana Ries. Frequent eastward to Lunenburg Co.; sometimes, as at Wallace Lake, Italy Cross, reaching the phenomenal height of 4.2 dm. with heads 6–7 mm. in diameter.

(*To be continued.*)

The date of the July issue (unpublished as this goes to press) will be announced later.



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